WHAT IS CLAIMED IS:

1. A delta-sigma modulator for driving an output stage operating between first and second voltages, comprising:

a loop filter;

a quantizer;

a feedback loop coupling an output of the quantizer and an input of the loop filter, the feedback loop including compensation circuitry for compensating for variations in the first and second voltages in response to a measured average of the first and second voltages and a measured difference between the first and second voltages; and

measuring circuitry for measuring the average and the difference of the first and second voltages.

2. The delta-sigma modulator of Claim 1, wherein the measuring circuitry comprises:

first and second analog to digital converters for converting the first and second voltages to first and second digital voltages;

a digital subtractor for taking the difference of the first and second digital voltages to generate a digital difference between the first and second voltages for utilization by the compensation circuitry; and

digital averaging circuitry for taking the average of the first and second digital voltages to generate a digital average between the first and second voltages for utilization by compensation circuitry.

3. The delta-sigma modulator of Claim 1, wherein the measuring circuitry comprises:

analog circuitry for taking the analog difference between the first and second voltages;

analog circuitry for taking the analog average of the first and second voltages;

a first analog to digital converter for converting the analog difference to a digital difference between the first and second voltages for utilization by the compensation circuitry; and

a second analog to digital converter for converting the analog average to a digital average of the first and second voltages for utilization by the compensation circuitry.

4. The delta-sigma modulator of Claim 1, further comprising gain compensation circuitry for applying a gain compensation factor to the measured average of the first and second voltages.

5. The delta-sigma modulator of Claim 1, further comprising offset compensation circuitry for applying an offset compensation factor to the measured difference between the first and second voltages.

6. A method of power supply voltage compensation in an amplifier having a noise shaper including a loop filter and a quantizer and an output stage operating between first and second voltages, comprising:

measuring a difference of first and second voltages;

measuring a sum of the first and second voltages; and

providing the measured sum and difference of the first and second voltages to the noise shaper for compensating for variations in the first and second voltages.

7. The method of Claim 6, further comprising:

subtracting the measured average value from an output of the noise shaper loop filter;

dividing the result of the subtraction by the measured difference; and

providing the result of the division to an input of the quantizer.

8. The method of Claim 6, further comprising:

multiplying an output of the quantizer by the measured difference;

adding a result of the multiplication to the measured average; and

feeding-back a result of the addition to an input of the noise shaper.

9. The method of Claim 6, wherein measuring the sum and difference of the first and second voltages comprise:

converting the first and second voltages to first and second digital voltages;

taking the difference of the first and second digital voltages; and

taking the sum of the first and second digital voltages.

10. The method of Claim 6, wherein measuring the sum and difference of the first and second voltages comprise:

taking the analog difference between the first and second voltages;

taking the analog sum of the first and second voltages;

converting the analog difference to a digital difference; and

converting the analog sum to a digital sum.

11. The method of Claim 6, further comprising adding an offset compensation factor to the difference.

12. The method of Claim 11, further comprising trimming the offset compensation factor comprising:

applying a selected value to an input of the amplifier;

measuring noise at an output of the amplifier; and

trimming the offset compensation factor to minimize the measured noise.

13. The method of Claim 12, wherein applying a selected value to the input of the amplifier comprises applying a zero-value.

14. The method of Claim 6, further comprising multiplying the measured sum by a gain compensation factor.

15. The method of Claim 14, further comprising trimming the gain compensation factor comprising:

applying a selected signal to an input of the amplifier;

measuring noise at an output of the amplifier; and

trimming the gain compensation factor to minimize the measured noise.

16. The method of Claim 15, wherein applying a selected signal to the input of the amplifier comprises applying a sine wave.

17. The method of Claim 6, further comprising adding a selected amount of noise to a selected one of the first and second voltages prior to measuring the sum and difference.

18. A digital amplifier, comprising:

an output stage for driving a load between first and second voltages;

a noise shaper for driving an input of the output stage and including compensation circuitry for compensating for variations in the first and second voltages in response to a measured average of the first and second voltages and a measured difference between the first and second voltages; and

measuring circuitry for measuring the average and the difference of the first and second voltages.

19. The digital amplifier of Claim 18, wherein the output stage comprises a pulse width modulator stage having an input driven by the output of the noise shaper.

20. The digital amplifier of Claim 18, wherein the output stage comprises a half-bridge output driver operating between first and second voltage rails supplying the first and second voltages.